



11

Pseudo Code for Translation Engine Control Module

100. CREATE Parameter_Table from User Input A & B database characteristics and default values
101. INSTRUCT Synchronizer to initialize itself
102. INSTRUCT Synchronizer to LOAD the History_File into its WORKSPACE
103. INSTRUCT B_Translator to LOAD all of B_records from B_Database and SEND to Synchronizer (Synchronizer STORES these records in WORKSPACE)
104. INSTRUCT A_Translator to SANITIZE B_records that were just LOADED (A_Translator USES Synchronizer services to read and write records in the WORKSPACE; Synchronizer maps these records using the B-A_Map before sending them to A_Translator and maps them back using A-B_Map before rewriting them into the WORKSPACE)
105. INSTRUCT A_Translator to LOAD all of A_records from A_Database and SEND to Synchronizer (Synchronizes STORES these records in WORKSPACE by first mapping then using the A-B_Map and them storing in their new form)
106. INSTRUCT B_Translator to SANITIZE A_records that were just LOADED (B_Translator uses Synchronizer services to read and write records in the WORKSPACE)
107. INSTRUCT Synchronizer to do CAAR (Conflict Analysis And Resolution) on all the records in WORKSPACE.
108. INFORM user exactly what steps Synchronizer proposes to take (i.e. Adding, Changing, and Deleting records). WAIT for User
109. IF user inputs NO, THEN ABORT
110. INSTRUCT B_Translator to UNLOAD all applicable records to B_Database.
111. INSTRUCT A_Translator to UNLOAD all applicable records to the A_Database.
112. INSTRUCT Synchronizer to CREATE a new History File.

FIG. 3

Pseudocode for Generating Parameter Table

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{Get Input from the user}
150.    ASK user to whether to synchronize based on a previously stored set of preferences
          (Previous_Preferences) or based on a set of new preferences (New_Preferences)
151.    IF New_Preferences THEN
152.        ASK user whether Incremental_Synchronization or Synchronization_from_Scratch
153.        ASK user following information and STORE in Parameter_Table
          a.    A_Application and B_Application Names
          b.    ADB and BDB Names
          c.    ADB and BDB Locations
          d.    Which sections to Synchronize
          e.    Conflict Resolution Option: IGNORE, ADD, DB WINS, BDB WINS, or NOTIFY
          f.    Other user preferences
154.        ASK user whether wants default mapping for the selected sections of the two databases or wants
          to modify default mapping
          LOAD A_Database-B_Database (2)
          IF Default_Mapping THEN
              STORE A-B_Map AND B-A_Map in Parameter_Table
          END IF
          IF Modified_Mapping THEN
              DISPLAY A-B_Map and B-A_Map
              ASK user to modify Maps as desired
              STORE the new A-B_Map and B-A_Map in the Parameter_Table
          END IF
      END IF
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FIG. 4A

FIG. 4B

FIG. 4

FIG. 4A

166. IF Previous_Preferences THEN
167. ASK user whether Incremental_Synchronization or Synchronization_from_Scratch
STORE in Parameter_Table
LOAD Previous_Preferences regarding which databases, mapping, and so on
STORE in the Parameter_Table

168. END IF

{User now specifies Date Range}

169. ASK user to choose Date Range Option

170. a. Previously chosen Automatic_Date_Range calculated from today
b. Input New Automatic_Date_Range
c. Input static Date Range for this Synchronization
d. All dates

171. CALCULATE Start_Current_Date_Range and End_Current_Date_Range based on values from step 170

172. STORE in Parameter_Table

173. LOAD parameters setting out characteristics of A_Database and B_Database from Parameters database, including

174. a. Field_List_A and Field_List_B
b. A_Translator and B_Translator Module Identifiers
c. ADB_Section_Names and BDB_Section_Name

175. STORE in Parameters_Table

176. FIG. 4B

200. RECEIVE following from Parameter Table

- 1) Name of A_App
- 2) Name of B_App
- 3) Name and Location of A_DB
- 4) Name and Location of B_DB
- 5) Section name of A_Application to be synchronized
- 6) Section name of B_Application to be synchronized
- 7) Incremental_Synchronization or Synchronization_From_Scratch Flags

SEARCH for H_File matching Parameters 1-6.

If Found H-File and Incremental_Synchronization THEN DO nothing

IF Found H-File and Synchronization_from_Scratch, THEN DELETE H_File

IF NOT found H-File, THEN SET Synchronization_from_Scratch AND ASSIGN file name for history file.

205. LOAD from Parameter_Table Start_Current_Date_Range and End_Current_Date_Range

206. LOAD from Parameter_Table Field_Lists for A-DB and B-DB and field and mapping information

207. If Incremental_Synchronization THEN COMPARE Field_Lists and Maps from Parameter_Table with History_Field_Lists and Maps

208. IF exact match THEN DO nothing

209. IF not exact match THEN DELETE H_file AND SET Synchronization_from_Scratch

210. CREATE WORKSPACE using Field_List_B

211. If Incremental_Synchronization THEN Copy H_file into WORKSPACE

212. FOR each H-Record update

{analyze & update source of extended index}

213. Do Nothing to NEXT_IN FIG

214.

FIG. 5A

FIG. 5B

FIG. 5

FIG. 5A

Pseudocode for Key_Field_Match

250. RECEIVE Key_Field_Hash and WORKSPACE_ID
251. For all records in WORKSPACE
 252. IF Match_Hash_Value equals Hash_Values of Record THEN LOAD the two records
 253. COMPARE the key fields two records
 254. IF Exact Match THEN SET Match_Found
 255. EXIT LOOP
256. END IF
257. END LOOP
258. If Match_Found THEN SEND Success Flag and WORKSPACE ID of Matching record

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Pseudocode for Conflict Analysis And Resolution (CAAR)

500. Analyze ID_Bearing FIGs.
501. Analyze and expand ID_bearing CIGs
502. Finding Matches between Recurring Items and Non-Unique ID bearing Instances
503. Analyze SKGs
504. SET CIG Types

FIG. 12

Pseudocode for Analyzing ID_bearing FIGs

550. FOR EVERY Recurring Master of ID_Bearing FIGS in H_file
551. FOR EVERY FIG H_Record in Recurring Master FIG
552. REMOVE Record from SKG if belongs to
553. IF Record is a singleton CIG, THEN ADD to New_Exclusion_List
554. IF Record is a doubleton CIG, THEN
555. IF the two Records in CIG are Identical, THEN remove other RECORD from
its SKG
556. END IF
557. ELSE IF the two records are NOT Identical, THEN ADD FIG record to
New_Exclusion_List and change records into singleton CIGs
558. END IF
559. END LOOP
560. CREATE Synthetic Master record entry in WORKSPACE
561. COPY value from one of the CIG mates into Synthetic Master
562. COPY Rep Basic (i.e. recurrence pattern) from the Recurring Master into Synthetic Master
563. COPY Exclusion List from the database Recurring Master into Synthetic Master and MERGE
with New_Exclusion_List
564. COMPUTE all Hash values for Synthetic Master
565. CREATE new FIG between Synthetic Master the CIGmates of the H-FIG records
566. CREATE CIG among the three Recurring Masters

{Fan Out Creep}

567. Fan out Recurring Master with Previous_Date_Range
568. Fan out Recurring Master with Current_Date_Range
569. IF two date arrays are NOT identical, THEN MARK CIG with Fan_Out_Creep flag
570. MARK all Records in H_File Recurring Master FIG and Synthetic Master FIG as
Dependent FIG
571. END LOOP

FIG. 13

Pseudo Code for EXPANDING ID_BASED CIGs

600. For each H_record,
601. IF single record CIG, THEN GO TO END LOOP
602. IF triple record CIG, THEN REMOVE CIG records from their SKGs
603. IF Dependent FIG, THEN GO TO END LOOP
604. IF record needed to make triple has to be from a DB with unique ID, THEN GO TO END
 LOOP
605. For all members of SKG to which H_record belongs
606. IF Non_Key_Field_Hash of H_record and SKG_record Match, THEN
607. IF Exact Match of all fields with H item THEN Strong_Match is found END
 IF
608. ELSE
609. IF H_Record is a Recurring Master, THEN Find Fanned Instance (Table
 Recurring Master/Instance Match) which is Strong_Match
 ENDIF
610. ENDIF
611. END LOOP
612. IF Strong_Match is found AND IF the SKG_Record is Weak_Match member of a CIG, THEN
613. REMOVE SKG Record from Weak_Match CIG AND Seek Alternate Weak_Match for
 the CIG
614. ADD SKG record to Current doubleton CIG AND Record for the Weak_Match_CIG
615. REMOVE all records in CIG from SKG
616. ENDIF
617. IF Strong Match is NOT found, THEN FIND Weak_Match
618. IF Weak Match is found, THEN create Weak_CIG
619. ELSE REMOVE all records in CIG from SKG
620. ENDIF
621. END LOOP

FIG. 14

Pseudo Code for Finding Weak Matches for a Record

```
622.  FOR EVERY Record in SKG
623.    IF (SKG record is from same database as records for which match is sought OR
624.      SKG record already is a Weak_Match record in a CIG OR
625.      SKG record is a Dependent FIG OR
626.      SKG record is Non_Recurring AND records for which is sought are not, OR
627.      SKG record is Recurring AND records for which is sought are not)
628.        THEN
629.          GO TO END LOOP
630.        ELSE
631.          If recurring item OR Key_Date_Field match Exactly, THEN Weak_Match is found
632.        END IF
633.      END LOOP
```

FIG. 15

920. IF Outcome = ADD, THEN
921. GET Current values of all Fields, from Synchronizer
 (Synchronizer maps for A database based on B-A, in response to each request)
922. CREATE new RECORD in DB
923. IF Unique_ID DB, THEN GET Unique_ID
924. SEND to Synchronizer (Success FLAG with any Unique_ID) OR (Failure Flag)
925. Synchronizer: Store Unique_ID in WORKSPACE
926. END IF
927. IF Outcome is UPDATE THEN GET Current values to be unloaded and original values loaded
 from database from Synchronizer
928. COMPARE and DETERMINE which Field to be updated
929. UPDATE fields in the record to be updated
930. SEND to Synchronizer (Success flag AND Unique_ID) OR (Failure Flag)
931. Synchronizer: STORE Unique_ID in WORKSPACE
932. END IF
933. END LOOP

FIG. 25B

1050. Verify History File
1051. If verified, Then Proceed as Fast Sync
1052. If not, Then Proceed as Synchronization from Scratch load all record in database

1053. If Fast Sync
1054. LOAD records into the Workspace. Map if necessary
1055. Sanitize Records not marked as Deletion
1056. Orientation analysis (Fig. 11).
For each H_Record, analyze the CIG that the H_Record belongs to.
IF the H_Record's CIG contains no Record from the Fast Synchronization database,
THEN CLONE the H-Item, label it a Fast Synchronization Record, and add it to the
H_Record's CIG.
If the H_Record's CIG contains a Fast Synchronization record that is marked as a
Deletion, it is now removed from the CIG.
If the H_Record's CIG contains a non-Delete Fast Synchronization Record, then do
nothing.

1059. .
1060. .
1061. .

END LOOP

FIG. 30

FIG. 31A

FIG. 31B

FIG. 31

1150. Verify History File
 If verified, Then Proceed as Fast Sync
 If not, Then Proceed as Synchronization from Scratch
1153. IF synchronization from scratch
1154. IF record outside of current_date_range THEN MARK record as out-of-range
1155. If Fast Sync
 Load History File into Workspace
 MARK History File records outside of previous_date_range as Bystander
 Load All Fast Synchronization Records into the Workspace; mapped if necessary.
 SANITIZE Records which are not DELETED
 Orientation analysis (Fig. 11).
1160.
1161. If Added Fast Synchronization record is out of current date range THEN MARK Out-Of_Range
 If Changed or deleted Fast Synchronization record in a CIG with Bystander H_Record, MARK
 the Bystander record as Garbage

FIG. 31A